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Pogo Mine Incinerator Update

December 12, 2013

Presentation to EPA by Sally McLeod, Pogo

Overview

- Takeaways
- History of Pogo's Small, Remote Incinerator
- Performance Test Results
- Audit Samples
- Electronic Reporting
- Operating Limits
- DAS and Control Equipment
- Other CISWI Requirements
- 2014 Schedule
- Takeaways

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Takeaways

- Compliance with Emission Limits Demonstrated for all but SO_2
- Add Control Equipment?
- Seven Operating Limits Established
- DAS to be Added for Continuous Monitoring
- 2014 Schedule

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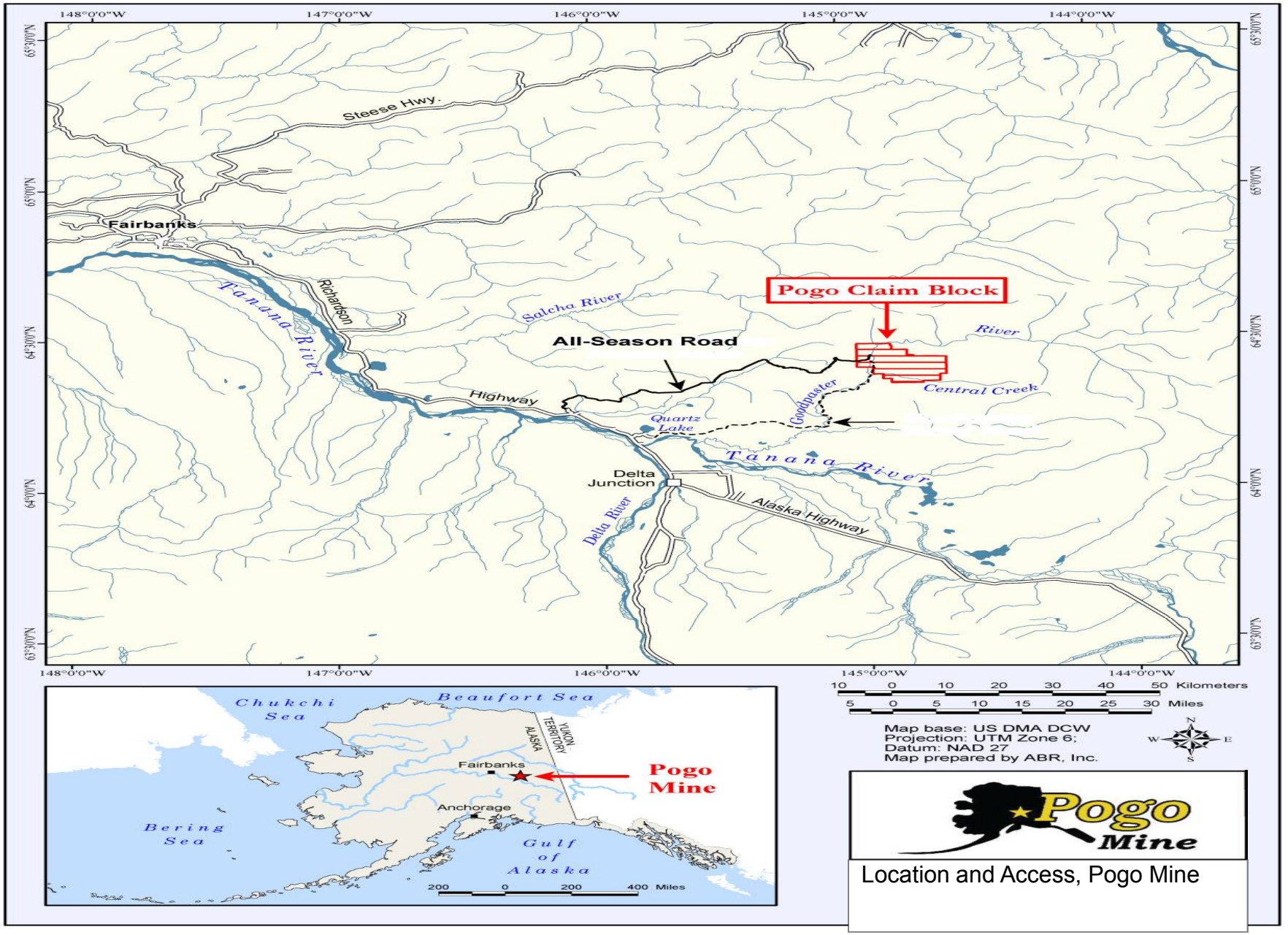

Location and Access, Pogo Mine

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Pogo's Small, Remote Incinerator

- Emission Unit 412 – ACS Inc. Model PC0400
  - Combusts solid waste
    - municipal solid waste
    - non-hazardous secondary materials
    - sewage treatment plant sludge
  - Combusts < 3 tons per day
  - Located > 25 miles from nearest MSW landfill
    - Fairbanks landfill is 135 miles from Pogo

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History of Pogo's Small, Remote Incinerator

Date	Action	Regulatory Authority
December 8, 2010	Unit 412 construction commenced	N/A
May 12, 2011	Unit 412 covered under ADEC Air Quality Control Minor Source Permit	AS 46.14; 18 AAC 50
February 19, 2012	Incinerator startup date	N/A
January 4, 2013	Initial notification letter to EPA	40 CFR §§ 60.2190; 60.2230
May 14, 2013	Submitted petition for site-specific operating limits to EPA	40 CFR § 60.2115
May 14, 2013	Submitted test protocols to ADEC	Minor source permit, Condition 25
June 26-28, 2013	Completed stack test consistent with CISWI requirements	40 CFR § 60.2125
Sept 27, 2013	EPA Approved Pogo's petition	40 CFR § 60.2115
Sep 29-Oct 3, 2013	Completed initial performance test	40 CFR § 60.2125
December 2, 2013	Submitted Test Report and Operating Limits Report	40 CFR §§ 60.2135 & 2200

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Genie
4x4
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June Stack Testing Results

Summary of June 2013 Pogo Mine Incinerator Source Test Results and NSPS Subpart CCCC Table 8 Standards

Method	Pollutant	Test Results (3-Run Average) lb/hr	lb/dscf	ppmvd	ug/dscm	ng/dscm	O_2 (%)	Calculated Results[a] mg/dscm	ng/dscm	ppmvd[c]	Subpart CCCC Table 8 Emission Limit[d]	
RM5	PM	0.20	4.13E-06	-	-		10.66	90	-	-	270	mg/dscm
RM26A	HCl	0.66	1.33E-05	-	-		10.66	-	-	191	200	ppmvd
RM29	Cd	3.98E-05	8.40E-10	-	32.25		10.67	0.044	-	-	0.67	mg/dscm
	Pb	2.22E-04	4.57E-09	-	197.08		10.67	0.27	-	-	2.0	mg/dscm
	Hg	7.79E-06	1.66E-10	-	2.67		10.67	0.0036	-	-	0.0035	mg/dscm
RM23	D/F	-	-	-	-	2.285	NA[b]	-	2.285	-	1800	ng/dscm Total Mass
		-	-	-	-	0.1154	NA[b]	-	0.1154	-	31	ng/dscm TEQ [e]
RM10	CO	0.005	-	1.3	-		10.7	-	-	1.8	13	ppmvd
RM7E	NOx	0.42	-	69.7	-		10.7	-	-	95	170	ppmvd
RM6C	SO_2	0.19	-	22.2	-		10.7	-	-	30	1.2	ppmvd

[a]Test results were converted to 7% O_2 and into units of the applicable emission limits

[b]D/F results are reported in terms of ng/dscm at 7% O_2 - no conversions needed

[c]HCl was converted from lb/dscf to ppmvd based on MW = 36.46 lb/lbmol, and standard molar volume of an ideal gas = 385.55 dscf/lbmol (i.e., std temp = 20 °C)

CO, NOx and SO_2 were measured at pmvd

[d]Emission limits are measured at 7% O_2, dry basis at standard conditions

[e]Subpart CCCC requires compliance with *either* the Total Mass Basis limit or the Toxic Equivalency Basis limit

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Initial Performance Test Results

Method	Pollutant	Test Results (3-Run Average) lb/hr	lb/dscf	ppmvd	ug/dscm	ng/dscm	O_2 (%)	Calculated Results[a] mg/dscm	ng/dscm	ppmvd	Subpart CCCC Table 8 Emission Limit	
RM5	PM	0.17	3.1E-06	-	-		10.85	72.9	-	-	270	mg/dscm
RM26A	HCl	0.54	1.1E-05	-	-		10.85	-	-	155	200	ppmvd
RM29	Cd	1.05E-05	2.1E-10	-	5.5		10.69	0.01	-	-	0.67	mg/dscm
	Pb	3.00E-04	6.0E-09	-	209.3		10.69	0.28	-	-	2.0	mg/dscm
	Hg	2.67E-06	5.4E-11	-	0.87		10.69	0.0011	-	-	0.0035	mg/dscm
RM23	D/F	-	-	-	-	0.108	10.54	-	0.14	-	31	ng/dscm TEQ
RM10	CO	0.003	-	0.8	-		10.69	-	-	1.0	13	ppmvd
RM7E	NOx	0.38	-	63.6	-		10.69	-	-	86	170	ppmvd
RM6C	SO_2	0.17	-	20.3	-		10.69	-	-	27	1.2	ppmvd

[a]Test results were converted to 7% O_2 and into units of the applicable emission limits

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Waste Recipes

- Day 1: MSW 32%, Sludge 49%, Absorbs 19%
- Day 2: MSW 40%, Sludge 34%, Absorbs 27%
- Day 3: MSW 76%, Sludge 11%, Absorbs 12%
- Day 4: MSW 100%

Note: Day 4 recipe exceeded second parameter

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Initial Performance Test Results

Test Parameter	Units	9/29/13	9/30/13	10/1/13	Average	Emission Standard
Particulate	mg/dscm	86.8	56.4	75.5	73	270
Sulfur Dioxide	ppmvd	35.1	30.4	19.8	27	1.2
Nitrogen Oxides	ppmvd	93.0	79.2	86.7	86	170
Carbon Monoxide	ppmvd	0.3	1.5	0.7	1.0	13
Dioxin and Furan	TEQ ng/dscm	0.0317	0.267	0.113	0.14	31
Hydrogen Chloride	ppmvd	193	136	138	155	200
Cadmium	mg/dscm	0.01	0.01	0.01	0.01	0.67
Lead	mg/dscm	0.01	0.51	0.22	0.28	2.0
Mercury	mg/dscm	0.0023	0.0009	0.0002	0.0011	0.0035

3 Visual determinations of smoke emissions were conducted between 9/30/13 and 10/1/13 according to RM 22. Visual emission frequency was zero percent for all 3 observation periods.

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Initial Performance Test Issues

- Audit Samples
- Electronic Reporting
- Operating Limits
- DAS and Control Equipment

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Audit Samples

- Results mixed, some passed
- Lab that provided audit samples may have made errors
- Lab that measured audit samples may have made errors and is re-running them
- Waiting for Audit laboratory to explain initial results

Electronic Reporting

- CDX Registration / Verification for Contractors to be completed mid-December
- Electronic submittal of performance test data to begin immediately following contractor verification

Operating Limits

Operating Limits Established in Performance Test

- Waste Charge Rate ≤ 53 lb, rolling 1-hr average
- Waste Charge Interval ≥15 min
- Primary Combustion Chamber Temperature Limit[1] ≥ 1,226°F
- Secondary Combustion Chamber Temperature Limit[1] ≥ 1,785°F
- Primary Combustion Chamber Burndown Time[2] ≥ 5 hr
- Secondary Combustion Chamber Burndown Time[3] ≥ 2 hr
- Waste Composition[4]: MSW ≤ 76%, Sludge ≤ 49%, Adsorbs ≤ 27%

[1]rolling 1-hr average (of 1-min DAS-recorded values)

[2]primary burndown period begins after loading of final waste-charge

[3]secondary burndown period begins at completion of primary burndown

[4]daily maximum waste component limits as rolling 3-day averages

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General Concept by Met-Pro Environmental

- Two Stage Process
  - Stage 1
    - Quench and Venturi
    - Quench is used to cool process temperature down
    - Venturi is used to separate the particulate out from the inlet stream
  - Stage 2
    - Scrubber
    - Packed Tower Scrubber will remove SO_2 and HCl
    - Additional environmental benefits:
      - HCl removed by SO_2 scrubber
      - Particulate matter (PM) and metals (adsorbed onto particulate) removal by quench, venturi scrubber, and packed tower scrubber

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Quench / Venturi

- Quench
  - Inlet temperature of 1400 deg F to be cooled to ~180 deg F
  - 304 SS Construction
- Venturi
  - Removes particulate 10 um and greater
  - 304 SS Construction

Quench

Venturi

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Scrubber

- Grey FRP material
- Designed for 3,500 ACFM
- Packed tower design
- 98% efficiency removal of SO_2
- 99% efficiency removal of HCl

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Other CISWI Requirements

- Waste Management Plan (§60.2055)
  - Written WMP in effect at Pogo since March 2006
  - WMP meets requirements of §60.2065
- Siting Analysis (§60.2045)
  - Completed in December 2013
- Operator Training and Qualification (§60.2070)
  - ACS (Incinerator Manufacturer) Training will be implemented to meet requirements of §60.2070(c)
  - Annual Refresher Course will be implemented to meet requirements of §60.2085
  - Documentation required in §60.2095 is available onsite & accessible to all operators

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2014 Schedule

- By May 15, 2014 Install Data Acquisition and Control System (DAS) and Control Device
- By July 15, 2014 Conduct Additional Performance Test
- By September 15, 2014 Demonstrate Full Compliance

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Takeaways

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